

University of Bahrain
College of Information Technology
Department of Computer Engineering

Test 1

Student Name:

Student ID No:

Section :

Course Title : Digital Logic
Course No. : ITCE 202
Program : Morning
Semester : First
Academic Year : 2006-2007
Date : Nov 1, 2006
Time Allowed : 1 Hours

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| Question | Points Attained |
|----------|--------------------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| Total | |

Question1 (30 point)

(a) Perform the following conversions:

(12 point)

$$(CA5.7)_{16} = (\quad)_8$$

$$(133.1)_4 = (\quad)_6$$

$$(0011)_2 = (\quad)_{6-4-1-1}$$

$$(1011)_{\text{excess-3}} = (\quad)_{10}$$

$$(11010100)_{2's \text{ complement}} = (\quad)_{1's \text{ complement}}$$

$$(-65)_{10} = (\quad)_{1's \text{ complement}} \quad \text{use 10 bit word.}$$

(b) Divide in binary 11101001 by 101 and approximate the result up to 3 fractional bits.
(6 point)

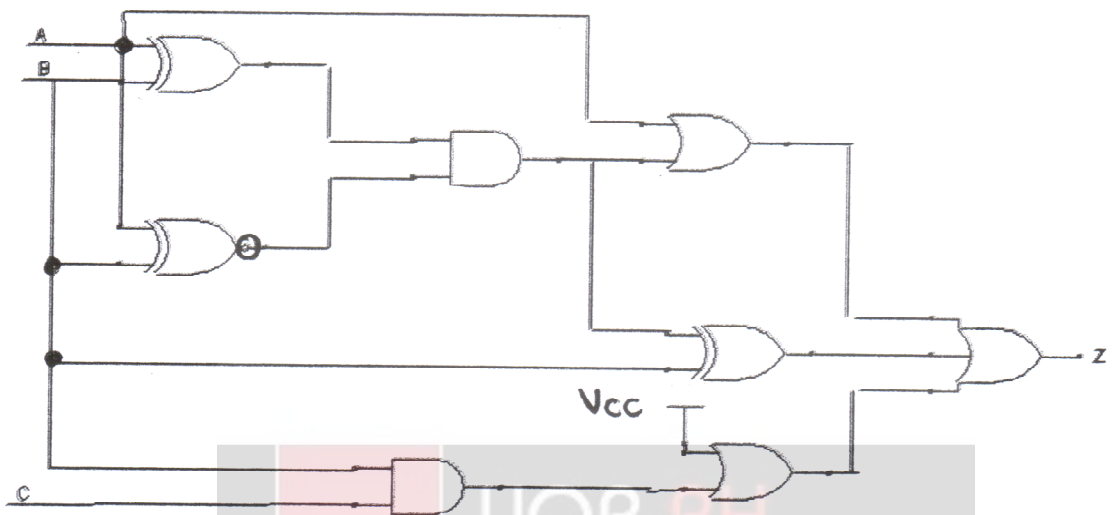
(c) Add the following using 2's complement representation. Use a word length of 8 bits including sign and indicate if an over flow occur.
(6 point)

$$-96 -35 =$$

(d) Add the following in BCD: $958_{10} + 193_{10} =$

(6 points)

Question 2 (10 point)



Write the simplified form of Z

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Question 3 (15 point)

A combinational circuit has three inputs A, B, C and one output Z. The output is zero only when the inputs are equal, otherwise the output is one.

a- Find the minterm expansion for Z (decimal and alphabetical expression)

b- Find the maxterm expansion for \overline{Z}



Question 4 (25 point)

a) Simplify the following expression

$$\bar{A}BCD + \bar{A}\bar{B}\bar{C}D + \bar{B}EF + CD\bar{E}G + \bar{A}DEF + \bar{A}\bar{B}EF + \bar{D}$$

b) $F = \overline{(X \oplus W)}(Y+Z) + X\bar{W}$

1- Give the Dual of F

2- Give \bar{F}



Question 5 (20 point)

Given $F = (a, b, c, d) = \Pi M(1, 4, 6, 11, 12, 13) \cdot \Pi D(0, 9)$

- a) Find the minimum sum of product for F
- b) Find the minimum product of sum for F

